In the second part of their paper the authors undertake a brief but comprehensive study of the distribution of the meteorological elements in the air masses throughout the regions they have been observing. They attempt also a comparison of the observed facts with the conditions to be anticipated from the Bergen theories. This is too detailed a matter to go into here, but their complete success in explaining all the outstanding phenomena in terms either of the front theory or most plausible local disturbing influences, is worthy of note. The types of weather involved, in general, may be classified in six groups, which, roughly speaking, occur in six latitudinal zones parallel to the front, and are completely explained by the kinds of meteorological activity to be expected at corresponding distances on either side of the front.

One of the most interesting facts brought out in this study of the characteristics of air masses of polar and tropical origin has to do with the distribution of the temperature, or potential energy. Although the author's data from the upper air levels are rather scanty, and local disturbing influences, especially at the mountain stations, are hard to eliminate, they find that up to at least four kilometers in the tropical air masses the isentropic surfaces (surfaces of constant potential temperature) are horizontal, while in the polar air they slope increasingly toward the ground as they approach the front. In the front itself, where the transformation from potential energy to kinetic energy largely takes place, and where, consequently, the center of gravity of the system is sinking, this slope of the isentropic surfaces is, of course, very steep. But the fact that these surfaces are sloping in the polar air and horizontal in the tropical air is in accord with two observed facts in this quite typical case; first, that there are secondary cold fronts or surfaces of discontinuity in the polar air, and second, that the tropical air appears to be continuous and homogeneous. Whether these are characteristic of all air masses of polar and tropical origin, respectively, can not be said without more study.

RESULTS OF AEROLOGICAL OBSERVATIONS MADE AT VARIOUS STATIONS IN THE NETHERLANDS DURING 1924

551.506 (492)

[Review by L. T. Samuels based on translation by W. W. Reed of the Results of Aerological Observations in 1924. Koninklijk Nederlandsch Meteorologisch Instituut]

Aerological observations by means of aircraft appear to be practicable on 86 per cent to 90 per cent of the days throughout the year. During the summer this percentage rises to 100 while in the winter months it decreases considerably especially during the period from November to February when fog often makes observations impossible for a week at a time. Experience shows that fog is the only condition which entirely prevents such observations. At the De Kooij flying field an unbroken layer of low clouds frequently presents a serious obstacle in the attainment of satisfactory flights on account of the danger in coming down over the sea.

The accompanying table gives the number of airplane observations made at Soesterberg and De Kooij together with the mean and maximum altitudes attained for each month and the year:

		January	February	March	April	May	June	July	August	September	October	November	December	Year
Number observations	Soesterberg	19	22	30	25	31	26	32	27	27	24	27	18	308
	De Kooij	10	15	26	17	19	15	15	13	18	21	10	5	184
Mean altitude (m.) M. S. L.	Soesterberg	4,821	4,588	4,598	4,909	5,345	5,434	5,638	5,514	5,478	5,295	5,276	5,172	5,180
	De Kooij	4,308	4,760	4,976	4,975	4,649	4,722	4,684	4,369	4,289	4,085	4,204	3,433	4,453
Max. altitude (m.) M. S. L.	Soesterberg	5,500	5,063	5,723	5,738	6,108	6,079	5,902	6,088	6,381	5,943	5,837	5,769	6,381
	De Kooij	5,092	5,036	5,204	5,263	5,431	5,384	5,671	6,279	6,525	6,012	5,291	4,987	6,525

This is most certainly a remarkable record of achievement and striking testimony to the practicability of this comparatively new method of observation. At Soesterberg, where the largest number of observations was made, it will be seen that, beginning with May, all of the monthly means were over 5,000 meters, while for July and August they were 5,638 meters and 5,514 meters, respectively. Ascents to over 6,000 meters were made at this station eight times, while 72 per cent of the flights went above 5,000 meters elevation.

Not a single accident occurred at either station in connection with these flights throughout the year. One forced landing owing to the sudden appearance of fog was made safely. A night airplane observation, made at De Kooij at 10 p. m. on March 10th and reaching an altitude of 4,526 meters, is deserving of special notice.

Seven sounding balloons were released during the year. Five of the instruments were recovered, all of which reached the stratosphere. In one of these cases, however, the clock stopped before the stratosphere was reached. The remaining four indicated the altitude and temperature of the base of the stratosphere to be as follows: March 19, 8,801 meters, −58.5° C.; May 23, 10,063 meters, −48.6°; May 25, 8,629 meters, −50.2°; July 19, 9,220 meters, −50.2°. The maximum altitude reached in this series of sounding balloon observations was 18,605 meters at which elevation the temperature was −48.7° C., on May 25.

Owing to the illness of the personnel only 13 kite flights were made during the year at Duin-dal. These reached an average altitude of 1,281 meters, the maximum being 1,564 meters.

Pilot balloon observations were made in general twice daily with occasionally three observations daily in summer. At De Bilt 436 observations were made of which 290 were followed up to over 1,500 meters, 110 to 4 kilometers, 56 to 6 kilometers, 33 to 8 kilometers, and 14 to 10 kilometers. The maximum altitude was 13.7 kilometers reached on May 27. At De Kooij the number of pilot balloon observations was 279, of which 157 reached an elevation of over 1,500 meters.

The above data are given in very complete and excellently arranged tables for convenient use of the investigator. No discussion is made, however, of the observational data appearing in the tables.